

Claims

1. A fusion protein, comprising a thrombolytic protein, an anticoagulant protein, and a linker peptide.
2. The fusion protein of claim 1, wherein said thrombolytic protein is selected from the group comprising staphylokinase(SAK), tissue-type plasminogen activator(t-PA), streptokinase(SK), urokinase(UK), urokinase-like plasminogen activator(u-PA), venom and mutants thereof which activates other hemolytic factors or have thrombolytic activity *per se*..
3. The fusion protein of claim 2, wherein said thrombolytic protein is staphylokinase or mutants thereof.
4. The fusion protein of claim 1, wherein said anticoagulant protein is selected from the group comprising hirudin, antithrombin III, venom and mutants thereof.
5. The fusion protein of claim 4, wherein said anticoagulant protein is hirudin or mutants thereof.
6. The fusion protein of claim 1, wherein said linker peptide is or comprises a peptide which can be recognized by blood coagulation factor.
7. The fusion protein of claim 6, wherein said linker peptide is an amino acid sequence IEGR, which can be recognized by blood coagulation factor FXa, or a peptide containing IEGR.
8. The fusion protein of claim 6, wherein said linker peptide is an amino acid sequence GPR(GlyProArg), which can be recognized by blood coagulation factor FIIa (thrombin), or a peptide containing GPR.
9. The fusion protein of claim 1, wherein said fusion protein is a fusion protein (SAR-GSIEGR-HV2) of staphylokinase and hirudin linked by linker peptide GSIEGR, a fusion protein (tPA-PRIEGR-HV2) of tissue-type plasminogen activator(t-PA) and hirudin linked by linker peptide PRIEGR, or a fusion protein (SAK-GSGPR-HV2) of staphylokinase and hirudin linked by linker peptide GSGPR.
10. The fusion protein of claim 1, wherein said fusion protein is a fusion protein (SAK-GSIEGR-HV2, or SFH) of staphylokinase and hirudin linked by linker peptide GSIEGR.
11. A method for preparation of a fusion protein comprising a thrombolytic protein and an anticoagulant protein, wherein said method comprises linking the thrombolytic protein gene and the anticoagulant protein gene together via a sequence encoding IEGR-or GPR-containing peptide so as to form the fusion protein gene, and then expressing said fusion protein gene in *E. coli*, yeast or animal cells to produce said fusion protein.
12. A pharmaceutical composition comprising a fusion protein and a pharmaceutically acceptable carrier or excipient.

13. The use of a linker peptide recognized by blood coagulation factor in the preparation of a fusion protein comprising a thrombolytic protein and an anticoagulant protein.
14. The use of a linker peptide recognized and cleaved by blood coagulation factor as the linker between a thrombolytic protein and an anticoagulant protein.
15. A method for the treatment of a disease or condition associated with thrombosis, comprising administering a therapeutically effective amount of the fusion protein to the patients suffering from thrombosis.